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TYPOLOGICAL OBSERVATIONS ON THE INDIC SCRIPT GROUP AND ITS RELATIONSHIP TO OTHER ALPHASYLLABARIES*

Richard Salomon
University of Washington
rsalomon@u.washington.edu

The Indic script family provides the most widespread examples of writing systems of the alphasyllabic or abugida type, which mark vowels by means of diacritic signs attached to the preceding consonants. This type of script is rare in other parts of the world except Ethiopia, but other scripts such as Meroitic and Old Persian cuneiform share some of its characteristic features. These alphasyllabic and related script types are compared with a view to determining their typological relationships and the historical factors underlying the parallel developments of such systems in different parts of the ancient world.

1. Theoretical introduction: Problems of classification of scripts

The traditional classification system that has prevailed in the past divided scripts into three types: logographic, syllabic, and alphabetic. It is, however, nowadays generally agreed by specialists that this classification is simplistic and unsatisfactory, among other reasons because few actual scripts, considered as fully functioning systems, belong entirely to one class or the other. For in practice, scripts often mix and combine in various and often complex ways logographic, syllabic, and alphabetic modes of representing the sound elements of the languages that they visually represent. For example, Japanese, like several of the most ancient scripts such as Egyptian and Sumerian cuneiform, combines logographic and syllabic representation. On another level, the Roman script as used for English is theoretically alphabetic, but when analyzed functionally, as opposed to formally, it can be considered to have some of the characteristics of a logographic system.¹

Thus analyses of script types should be undertaken on two separate levels: first, on the level of the mode of representation used by the individual graphs *WITHIN* a script system to represent linguistic elements, be they words, syllables, or phonemes, and second, on the level of the script as a whole, as a complex system which may combine two or more modes of graphic representation.² Thus, to continue with the example of Japanese, on the first level we have both *kana* characters embodying syllabic representation and *kanji* characters representing logography. On the second level, then, Japanese writing as a complete system constitutes a mixed syllabic-logographic type.

But this distinction between analysis of individual graphs and of overall systems does not, of course, solve the overall problem of script typology; I men-

tion it only by way of clarifying the nature of the larger problem. This problem is essentially that the aforementioned tripartite division of sound representation, though convenient and time-honored, does not nearly suffice to describe the types of graphic representation that actually exist among the scripts of the world, ancient and modern. For among them we often find, among other varieties, classes of characters that are neither strictly alphabetic, in that they do not represent a single sound unit or phoneme, nor strictly syllabic, in that they do not stand for a single and indivisible syllabic unit. Thus more recent and more sophisticated studies of the typology of scripts have tried in various ways to grapple with these and other grey areas between the traditional three categories of logographic, syllabic, and alphabetic representation. For example, Peter Daniels in the now-definitive *The World's Writing Systems* (Daniels & Bright 1996:4) states that 'half a dozen fundamentally different types of writing systems have been devised with respect to how symbols relate to the sounds of language'. These, in Daniels' formulation, are:

1. Logosyllabary
2. Syllabary
3. Abjad or consonantary, in which characters represent consonants only, with the vowels left unrepresented.
4. Alphabet
5. Abugida (also called alphasyllabary, neo-syllabary, pseudo-alphabet, semisyllabary, etc.), in which the basic consonantal characters are understood to imply a particular 'inherent' following vowel, unless another vowel is explicitly indicated by a modification of the basic consonant sign.
6. Featural system, in which 'the shapes of the characters correlate with distinctive features of the segments of the language' (Daniels & Bright 1996:4), as in the Korean Hangul script.

This scheme is obviously a vast improvement over the traditional one. One could, as always, quibble about the details. For example, it is not clear to me why 'featural' systems, of which Korean is apparently the only example among the standard scripts of the world, should be classed as a separate category, since Hangul is otherwise an alphabet in the full sense of the term despite some unusual secondary but ultimately superficial features. In any case, it is probably impossible, and perhaps unnecessary, to establish a definitive and comprehensive list of script types. For no matter how such a list is formulated, and no matter how many script types are included in it, there will inevitably be some cases that will not fit neatly into one or the other category, but rather will fall into a grey area between two or more of the basic types.³

This is particularly the case in regard to the relationships among alphabets, syllabaries, consonantaries, and alphasyllabic or 'abugida' scripts.⁴ Although there is no question that Daniels and others are correct to set each of these up as basic and distinct (though not necessarily unrelated, systemically and historically) classes, there are still some scripts which have been used at various times and in

various parts of the world which do not fit precisely into any one or the other of them. The intention of this paper to attempt a clarification, if not a solution, of these problems, by analyzing and comparing certain examples of such scripts which straddle the gaps between consonantal, alphabetic, and syllabic types of writing, with particular reference to the alphasyllabic and similar scripts.

2. The Indic scripts as a prototype of the alphasyllabic class: Historical, linguistic, and systemic considerations

It is convenient to begin the discussion of these issues by reference to the Indic scripts, as they constitute the most typical and most widespread specimens of the alphasyllabic scripts. The following features, or at least the first three of them, can be characterized as definitive of an alphasyllabic script:

- (1) The physical graphic unit is the syllable, typically of the types V, CV, CCV, etc.
- (2) An unmarked consonantal graph is understood to have an automatic or 'inherent' vowel (in the Indian scripts, the so-called 'short *a*') following it, unless an explicit mark for another vowel overrules the implied neutral vowel, as in Devanāgarī क *ka*.
- (3) Vowels other the inherent vowel, when following a consonant, are indicated by the addition of an extra 'diacritic'⁵ sign, which is typically attached directly to the consonantal character, as in Devanāgarī का *kā*, कि *ki*, कु *ku*, etc.
- (4) Vowels which do not follow a consonant (i.e., word-initial vowels or the second vowel in a V-V sequence) are represented by separate graphs, namely the 'full', 'initial', or 'independent' vowel signs, such as Devanāgarī अ *a*, इ *i*.⁶

Thus, for example, the Sanskrit word *akāri* 'it was done' is segmented into graphic syllables as *a-kā-ri* and written in Devanāgarī script as अकारि.

This alphasyllabic type of script shares some of the characteristics of the traditional definition of an alphabet, in that:

- (1) Unlike a consonantary or syllabary, it has distinct graphic elements for vowels and consonants.
- (2) It has graphic units, or at least sub-units, which correspond to individual phonemes rather than to words and syllables.

On the other hand, an alphasyllabary also shares features with the traditional syllabary, in that:

- (1) The primary graphic unit is the (graphic) syllable, that is, the Indian *akṣara*.
- (2) The syllabic units are in most cases indivisible in the sense that at least some of their component parts, namely the secondary or 'diacritic' vowel signs, cannot stand alone.

As Daniels has correctly argued, it is not satisfactory to dismiss alphasyllabaries as a sort of compromise or halfway step between syllabaries and alphabets; to do so simply reflects the mental strait jacket of the traditional tripartite system.

and does not explain or reveal anything. Therefore it is appropriate to posit the alphasyllabary as a script type distinct and separate from alphabets and true syllabaries, though not unrelated to them.

But even when alphasyllabaries are set off as a distinct category, further problems still arise when we look at certain other scripts which share some characteristics with alphasyllabaries, but which do not have all of their defining features.⁷ A common feature of alphasyllabaries and what I refer to here, for purposes of discussion, as 'alphasyllabary-like' scripts is the principle of the inherent vowel. In this respect, it could be claimed that alphasyllabaries are also related to Daniels's 'consonantaries', insofar as a consonantary can be said to consist of consonantal characters that are understood to be followed by a (or rather, any) vowel, which is left graphically unmarked. From this point of view, an alphasyllabary can be understood to be an 'improvement' (in the semi-technical sense of the term, as used in Daniels & Bright 1996:8) on a consonantary, achieved through the addition of extra graphs in the form of vowel-specifying diacritics. In fact, there is reason to believe, in the Indian case at least, that this is precisely what happened in the historical evolution of alphasyllabaries (Salomon 1998:16).

It is interesting to note that there is a consistent pattern among alphasyllabaries and related script types, such as Old Persian cuneiform, in their choice of the inherent vowel. Typically, it is a neutral or central vowel such as the so-called 'short *a*' (ʌ or ə) in Indic and Old Persian or *a/ä* in Ethiopic. This consistency is presumably not coincidental, though it is not certain whether it is determined by systemic or historical factors, or perhaps rather by both. The pattern is reminiscent, probably significantly so, of the secondary development of *matres lectionis* in connection with the Semitic consonantaries, especially Aramaic and its derivatives, wherein more 'marked' vowels such as *i* and *u*, particularly when long or diphthongized, were singled out for explicit indication by the phonetically most closely related consonants (namely *y* and *w*, respectively). Thus although the mode of graphic representation of such 'marked' vowels is different in the northwest Semitic scripts and in the alphasyllabaries, the distribution of marked versus neutral or inherent vowels is similar. While this parallel could be attributed to the nature of the vowels themselves, it is also by no means out of the question that the conceptual framework of the Indian alphasyllabaries, at least, was influenced by that of the Aramaic script, since Aramaic appears to be the ultimate source, though not necessarily the direct prototype, of the Indic scripts (Salomon 1996:378).

If we can suppose, for purposes of discussion, that the evolution of writing systems is at least in part determined by practical and rational factors (even though experience teaches us that this is not always as important a factor as is often assumed), the principal advantage of the inherent vowel would be one of economy, in that it permits writers to omit one of the commonest vowels of their languages in all or most of its occurrences. It is therefore perhaps no coincidence that the inherent vowel in the Indic scripts, the 'short *a*', is the one which is statistically by far the most common in most of the languages which these scripts are used to record, and particularly in the Prakrit and Sanskrit languages in connec-

tion with which they were originally devised. Similarly, in the Old Persian cuneiform script, short *a* also functions essentially as an inherent vowel, although the situation is rather more complex there than in the Indic scripts (as will be discussed in part 3 of this paper). As a sub-family of the Indo-European group, the Indian and Iranian languages share a common sound change whereby the original Proto-Indo-European vowels *ē* and *ō* both became *ā*, with the result that the latter vowel is statistically predominant in both families.⁸ This common linguistic heritage could thus be the one of the reasons that *a* functions as the inherent vowel both in Old Persian cuneiform and in the Indic scripts, even though the scripts themselves are not historically related.

But if we are to view the alphasyllabic system and its inherent vowel principle in practical terms, we must also note that it involves, at least potentially, a complication in connection with the representation of vowelless consonants, that is, consonants which are prior members of consonant clusters or which are in word-final position. Since an unmarked consonant automatically implies a particular following vowel (i.e., the 'inherent' vowel), some special device must be developed if the writer wishes to explicitly indicate that a consonant is followed by another consonant, or by nothing, within the larger graphic unit, typically a word. The different alphasyllabaries and alphasyllabary-like scripts treat this problem in various ways, one of which is simply to ignore it, satisfying themselves with a recognizable approximation of actual pronunciation. But in the Indian case the developments in this regard are complex, but also, fortunately, historically fairly well-documented and typologically interesting.

Brāhmī script, which was the more widespread and historically more important of the two early Indian scripts of the historical period,⁹ and its derivatives did have, or rather did develop devices to indicate vowelless consonants, but the role of these devices is more complex than one might have guessed. One such device is, in its modern form, a diagonal line, called *halanta* 'consonant [marker]' or *virāma* 'stopping [sign]', attached to the lower right corner of the consonant (e.g., क् *k*) which is to be designated as vowelless. Its use, however, is severely circumscribed. It is employed, for the most part, only in writing Sanskrit, and appears rarely in the many other languages written in Indic scripts derived from Brāhmī; and even in Sanskrit it is employed with what seems to be great reluctance. For example, when a word ends in a consonant and the following word begins with a vowel, the two phonemes are combined together in a single graphic syllable that spans the two separate words; thus the phrase *ayam asti* 'this is' would normally be written as अयमस्ति (i.e., *a-ya-ma-sti*) rather than अयम् अस्ति *ayam asti*. Thus, the vowel-cancelling marker is avoided even at the cost of ambiguating word boundaries and constructing an *akṣara*, in this case म *ma*, whose phonetic components, *m* and *a*, belong to two different words.

The vowel cancellation sign is also not normally used to mark consonant clusters within (and between) words. In such cases, a ligature or 'conjunct syllable' (*saṃyuktākṣara*) of the two (or more) consonants involved is formed, with the first consonant(s) being abbreviated in such a way as to indicate that its inherent vowel is suppressed. Thus the word *anta* 'end' is written in Sanskrit as अन्त

rather than as अन्त, which would be read as the unrelated *anata* 'unbowed'. Unlike the rare *halanta* vowel-canceling sign, this ligaturing technique is very widely used, especially in writing Sanskrit, which has many consonant clusters, but also, to a lesser but still significant extent, in most of the other Indian languages and scripts.

The avoidance of the *halanta* sign in the Indic scripts may seem strange to those who are accustomed to reading and writing in alphabetic scripts, since it necessitates a complex system of conjunct consonants — hundreds of them, which must be learned individually, are used in Sanskrit — as well as blurring word divisions. Nonetheless, the *halanta* is for the most part used only when completely unavoidable, as for instance when a sentence or line of text ends in a consonant. This seeming anomaly must be understood in light of the historical developments within these scripts, which reveal that the *halanta* is historically as well as functionally secondary. No method of indicating vowelless consonants is attested in inscriptions until about the second century A.D. (Salomon 1998:37), at which time it was necessitated by the increasing use of Sanskrit as an epigraphic language. Before this time most of the surviving records of the Brāhmī script are in various vernacular dialects, or Prakrits, and several graphic features of the early forms of the script confirm that it was developed for and in connection with Prakrit rather than Sanskrit. For, whereas Sanskrit has many consonant clusters and word-final consonants, the Prakrits have virtually no word-final consonants and generally have only simple clusters of geminates or of nasals plus homorganic stops. Thus a script devised for Prakrit has no particular need for a vowel-cancellation sign; geminate consonants can be easily, if approximatively, indicated by the single consonant, nasal-plus-stop clusters are noted by a punctuation mark (*anusvāra*) indicating nasalization, and word-final consonants are absent.

Thus it was only when the Brāhmī script was adapted to Sanskrit, centuries after it was originally invented or adapted for writing Prakrit, that the notation of vowelless consonants became a significant problem and that various devices such as the modern *halanta* sign were developed for this purpose, albeit only as a stopgap in otherwise unavoidable situations. Consonantal conjuncts are present, though in limited numbers and somewhat primitive forms, in the earliest datable documents in the Indic scripts, namely the Aśokan inscriptions of the third century B.C., but it is easy to conceive of an earlier stage of Brāhmī in which there were no conjuncts at all, and in fact some very early inscriptions that are written in a less formal manner than the imperial Aśokan edicts do in fact lack, completely or nearly so, conjunct consonants. Thus it is not at all unlikely that the Brāhmī script in its earliest form (no specimens of which have survived) had no consonant conjuncts, and thus had no way of indicating vowelless consonants as such; and this, as we shall see shortly, is in fact the most typical pattern in alphasyllabic and similar scripts other than the Indian ones.

Indeed, even in the modern Indic scripts derived from Brāhmī, the *halanta* sign is of marginal status, being mostly restricted to learned Sanskrit loan words, and in some Indic scripts it is entirely absent. Consonant conjuncts are widely

used in most of the modern scripts and languages, but for the most part only in connection with loan words from Sanskrit and other languages such as Persian and English. Otherwise, where the spoken language has vowelless consonants in *tadbhava* or 'native' words (that is, words derived from, as opposed to secondarily borrowed from Sanskrit) they are usually indicated by the basic consonant with, theoretically, the inherent vowel, which is however intuitively understood by the native speaker/reader as to be suppressed. Thus Hindi *karnā* 'to do' is written कर्ना, which would be formally transcribed as *ka-ra-nā*, but would never be pronounced as such.

In short, the notation of vowelless consonants in the Indic scripts as a whole is a marginal matter, and is a significant concern only in the Sanskrit tradition, which is characteristically conscious of and concerned with accuracy in phonetic representation. In vernacular languages, whether ancient or modern, vowelless consonants are in effect a non-problem, with the ambiguities that they theoretically cause being easily outweighed by the principle of economy and the intuitive understanding of the native speaker as to which inherent vowels are to be pronounced and which suppressed. In other words, outside of the learned Sanskrit sphere and its penetration into the more elevated and literary forms of the vernacular languages, the representation of vowelless consonants in the Indian scripts is approximative and intuitive, as is typical of alphasyllabic scripts generally.

3. Inherent vowels and related issues in other alphasyllabaries and alphasyllabary-like scripts

The only other script family that fits the strict definition of an alphasyllabary is the Ethiopic group. Although, as will be discussed below, Ethiopian scripts do not agree in all respects with the Indic type of alphasyllabary, they are similar enough that they can definitely be placed in the same general category. The essential common feature of Ethiopic and Indic scripts is the system of indicating vowels by means of diacritic additions to a basic form of each consonant, with the unmarked consonant having an inherent or implied vowel *ä* or *a*. The ramifications of the Ethiopic system, however, are rather different from those of the Indic scripts. First, the Ethiopic script group does not have the dual vowel notation system of Indic, lacking the 'full' or 'independent' vowel signs, presumably because the languages represented have no word-initial vowels; thus in Ethiopian, vowels can *only* be represented as diacritic modifications of preceding consonants. Second, the representation of vowelless consonants is treated differently than in Indic. In Ethiopic writing they are conventionally indicated by using the form of the consonant with the diacritic for the vowel *ə* (Haile 1996:572). This method avoids the complications of consonant conjuncts and vowel cancellation signs in the Indian, particularly the Sanskrit system, and native speakers presumably have no difficulty in knowing when this vowel is to be pronounced and when it is suppressed, just as speakers of modern Indian languages know intuitively when not to 'read' a suppressed inherent vowel, as in the example cited in the previous

section. Thus in Ethiopic scripts, as in the less formal applications of the Indic system, what is lost in (theoretical) precision is gained in simplicity and economy.

In view of the systemic similarity of the Indic and Ethiopic scripts, of the rarity of this script type worldwide, and of the chronological priority of the Indian over the Ethiopic scripts, it has been proposed¹⁰ that the Ethiopic vowel system was influenced by an Indian model. This is not impossible on historical grounds, since trade and cultural contacts between India and Ethiopia in ancient times are well documented, but as far as I am aware no direct proof of Indian influence, beyond the systemic parallels, has been offered. It has also been suggested (Diringer 1953:231) that the concept, if not the specific technique of vowel notation in Ethiopic was inspired, not by an Indian, but rather by a Greek model.

But perhaps it is more prudent to assume, for lack of proof to the contrary, that the Ethiopic alphasyllabary was an independent invention, parallel to but not based on the Indic model. In both cases, the underlying factors were similar, involving the adaptation of a pre-existing Semitic consonantal script (Aramaic, apparently, in the case of Indian scripts, and the south Semitic Sabaean script for Ethiopic) to a different language. This is precisely the sort of situation which, over and over in the history of writing throughout the world, has stimulated the development of 'improvements' (in Daniels's sense) in script systems, particularly in respect to the fuller notation of vowels in consonant-based scripts. Different adaptations were worked out in different places, and it is not at all hard to imagine that the alphasyllabic system could have been invented twice separately. As a parallel example, we might compare the celebrated development of the alphabetic Greek script from a Phoenician consonantary, with the less well-known and much later, but essentially parallel development of the Mongolian script, which similarly expanded the *matres lectionis* system of its prototype (ultimately Aramaic, through Sogdian and Uyghur) to the point that it represents every vowel with an individual (originally consonantal) character, and thus has, in effect, become a pure alphabet like Greek.

Whatever may have been the historical origins of the Ethiopic script group, it is, as far as I have been able to determine, the only other true alphasyllabic family besides the Indian scripts. What remains to be discussed, however, are scripts which partake of some of the defining characteristics of this type — particularly, the inherent vowel system — but not of all of them. Two interesting examples of such scripts are Meroitic, the ancient script of the Sudan, and Old Persian cuneiform. It may or may not be simply a matter of coincidence that each of these are found in geographical regions that are at least approximately contiguous to the areas, namely Ethiopia and India respectively, where true alphasyllabaries are found, and that the time of their use overlaps with, or at least approximates those of the neighboring alphasyllabaries. But once again, it is probably more prudent, in the absence of direct evidence, to think in terms of parallel developments, or perhaps of indirect inspiration by example, than of direct influence.

Meroitic script, which was in use from about the third century B.C. to the fourth century A.D., is an unusual system which superficially looks like an alpha-

bet, but which on closer examination proves to have an unusual combination of syllabic, alphasyllabic, and alphabetic characteristics. Thus in Davies's opinion (1990:133), '[a]lthough it looks alphabetic, Meroitic is in fact a syllabic system'. Meroitic script has a repertoire of twenty-three characters, of which fifteen represent simple consonants (*y, w, b, p, m, n, r, l, ḥ, ḫ, s, k, g, t, d*), four syllabic combinations (*ne, se, te, to*), and three vowels (*e, i, o*), plus one anomalous character which represents *a*, but only in initial and never in post-consonantal position. The reason for this latter peculiarity is that there is no need for a sign for non-initial *a*, since a consonant that is not followed by a vowel sign is automatically understood to be followed by the vowel *a*. In other words, the Meroitic script has an inherent vowel system that is, in principal if not in outward form, the same as that of the Ethiopic and Indic scripts, and moreover, it shares with them the choice of *a*, that is, of a neutral central vowel, as the inherent one. The outward difference between Meroitic on the one hand and the Indian and Ethiopian alphasyllabaries on the other is that the former has a superficially 'alphabetic' system, in that the post-consonantal vowels are represented by physically separate and distinct characters, rather than as diacritic additions to the consonantal characters. This feature, I assume, is what Davies has in mind when he characterizes Meroitic as a syllabic script that looks like an alphabet.

As a function of this system, Meroitic script also agrees with Indic in having a symbol for the vowel *a* only in word initial position, since post-consonantal *a* is represented, in effect, by zero. Its other vowel characters differ from those of the Indic scripts, however, in that they have only one form, as opposed to Indic, which has for each vowel (other than the neutral vowel *a*) two completely distinct forms, namely a 'full' or word/syllable-initial position sign and a post-consonantal or diacritic form.¹¹

Like all alphasyllabic or inherent-vowel scripts, Meroitic requires a special technique to represent vowelless consonants, that is, consonants followed by another consonant or word-final consonants. This it accomplishes by writing the sign for the vowel *e* (Davies 1990:133), which thus has a double function, representing either a neutral vowel (schwa, according to Priese 1973:283) or no vowel at all; the choice between the two possible readings is presumably left to the intuition of the native speaker/reader of the language. In this respect, Meroitic works precisely like Ethiopian and differs from Indic, which, uniquely among all alphasyllabic scripts as far as I have been able to determine, has developed the conjunct consonant system and, as a backup, a vowel-cancellation sign.

A further peculiarity of the essentially simple Meroitic system is the presence of four truly syllabic, that is, indivisible signs for CV syllables. These present a problem for both the historical and typological analysis of the script. For although graphic archetypes for these syllabic characters can be identified in the demotic Egyptian script which is the source of the Meroitic characters generally, it is not clear why these and only these four syllables received special treatment; according to N.B. Millet (1996:85), this was done '[f]or reasons not understood, but possibly having to do with the existence of dialect differences'. In principle, though, the presence of these typologically aberrant characters should not dis-

turb us unduly, since, as noted at the beginning of this paper, mixed script systems are far from unusual.

The preceding typological comments about Meroitic are made primarily from the point of view of comparison with the alphasyllabic and alphasyllabic-like scripts; but it may also be profitable to compare Meroitic with other types of scripts, such as consonantaries and, particularly, modified consonantaries. If, for example, we were to compare Meroitic to Aramaic written with *matres lectionis*, or with modern Hebrew or Arabic, here too we would find significant typological similarities, the main difference being that in Meroitic all vowels other than *a* are explicitly indicated, whereas in the modified consonantaries only the long and diphthongized vowels are, in general, written, while vowels such as *ĩ* and *ũ* are left to be filled in by the reader.

Thus although conventional descriptions of alphasyllabaries and related script types on the one hand, and consonantaries and modified consonantaries on the other, involve different terminologies and presuppositions, in principle these two systems are less different than they seem on the surface. Describing modified consonantaries like (later) Aramaic from the alphasyllabic point of view, so to speak, one could say that they are Meroitic-type alphasyllabaries, with separated vowel signs in which the inherent (i.e., unmarked) vowel is 'any short vowel', rather than *a* as in Meroitic, Indic, etc.

From this point of view, the distinctions, even those in a sophisticated modern typology such as that proposed in *The World's Writing Systems*, between categories such as alphasyllabary and (modified) consonantary begin to break down. This comment is not meant as a criticism of that typology, but rather is meant to point out the inherent limitation of any typology of writing systems. Actual writing systems, as opposed to ideal types and individual components of complex systems, rarely fall squarely and completely into any one category, and when we try to categorize scripts, we have to be willing to think in terms of approximations and combinations of theoretical archetypes, rather than of rigid boxes or water-tight compartments.

Finally, with regard to the possibility of external influences or models on the development of the Meroitic script, Priese (1973:283-4) briefly considers, but ultimately rejects, influences from systems such as the Ethiopic, Old Persian, or Indian scripts. He concludes (284) that 'wir . . . hier nicht nötig haben, nach fremden Vorbildern zu suchen', on the grounds that the inherent vowel of Meroitic script can readily be explained as a result of internal developments, whereby the use of the originally consonantal characters *j* and *w* to note the vowels *i* and *u* respectively in what was originally a consonantal script leads, by a logical but presumably unconscious process of elimination, to the vowel *a* being assumed when no other vowel is written; that is to say, *a* becomes the default, or unmarked, or inherent vowel. This pattern of development is in fact exactly what I would posit for the development of alphasyllabic-type scripts in general.

The Old Persian cuneiform script has long been a subject of discussion and controversy in grammatological literature, largely due to its stubborn refusal to fit

conveniently into any of the normal typological classes, whether traditional or more sophisticated, such as that of *The World's Writing Systems*. Old Persian cuneiform, which originated, apparently by way of a systematic invention (Hoffmann 1976:621), in, probably, the late sixth century B.C. (622), contains the following repertoire of graphs:

Three vowel signs, *a*, *i*, *u*, used interchangeably in initial or medial (post-consonantal) position.

Thirteen alphasyllabic-type vowel-neutral consonant signs, that is, signs representing consonants plus the neutral vowel *a* unless some other vowel is indicated by a following separate vowel character: *p(a)*, *b(a)*, *f(a)*, *ç(a)*, *θ(a)*, *s(a)*, *z(a)*, *h(a)*, *c(a)*, *š(a)*, *y(a)*, *x(a)*, *l(a)*.

Twenty indivisible syllabic signs, representing specific CV syllables: *da*, *dī*, *du*; *ma*, *mī*, *mū*; *ka*, *ku*; *ga*, *gu*; *ta*, *tū*; *na*, *nū*; *ra*, *rū*; *ja*, *jī*; *va*, *vī*.

Seven logographic signs for 'king', 'land', 'god', 'earth', 'Ahuramazda' (two signs), and *ahuramazdāha* (genitive singular of 'Ahuramazda').

Even beyond this unusual and complex mixed repertoire of sign types, the Old Persian script has several further peculiarities. For one thing, the syllabic characters (*dī*, *du*, etc.) are regularly (though not invariably) 'reinforced' by the addition of the corresponding vowel sign, as in the spelling *dī-i-p(a)-i-m(a)*, instead of **dī-p(a)-i-m(a)*, for /dipim/ 'inscription' (Testen 1996:137). In other words, the system is used in a way that introduces a considerable degree of redundancy.

Moreover, the repertoire of syllabic characters does not, as one might have expected, correspond to the repertoire of syllables that actually occur in the Old Persian language (Hoffmann 1976:625). For example, the syllables *tī*, *nī*, and *rī*, do not have separate characters, but they do exist in the language; thus the word *patikarā* 'sculptures' must be written as *pa-t(a)-i-ka-ra-a* (Testen 1996:137). Nor, as we might logically expect, do the thirteen vowel-neutral or alphasyllabic consonants seem to comprise any special phonetic class in the language. In short, the logic of the distribution of syllabic characters in Old Persian cuneiform has eluded all attempts at an explanation, and appears to be to a large extent arbitrary or capricious.

These peculiarities lend to the Old Persian script an unique combination of characteristics of different conventional classes of script systems. For it works like a syllabary in regard to its set of twenty characters which, in and of themselves, are syllabic characters in the strict sense of the term. But it also has characteristics of an alphabet in that it regularly supplements both the syllabic graphs, as well as the vowel-neutral consonants, with independent graphs for vowels. It also works like a consonantary in that it has a set of thirteen consonantal characters which are vowel neutral. And finally, it shows features of an alphasyllabary, or rather a semi-alphasyllabary like Meroitic, in that the consonantal characters are presumed to have a neutral inherent vowel, namely *a*, unless another vowel is explicitly indicated by the addition of a following vowel character.

Though odd in typological terms, the Old Persian script is somewhat less so from a historical point of view. For the inventor(s) of this script were no doubt familiar with, and presumably literate in at least two other scripts which were in wide use in the Achaemenid empire, namely the logosyllabic Babylonian cuneiform and the modified consonantary Aramaic. The syllabic and logographic characters of the Old Persian script are evidently inspired by, though not directly borrowed from or modeled upon the corresponding character types that predominated in Babylonian cuneiform, while the vowel-neutral consonants work more or less like Aramaic characters, which represent the consonant plus any vowel, with some 'strong' vowels such as *ī*, *ū* and diphthongs specifically marked by *matres lectionis*. In Old Persian, however, ALL vowels other than the 'neutral' *a* are so indicated. Thus, if we can view this aspect of the Old Persian script system as a refinement of the Aramaic system, we see a development that is precisely parallel to that of Meroitic, namely, one in which a partial system of marking certain vowels by *matres lectionis* or their functional equivalent has been expanded to explicitly represent all vowels other than one, typically a phonetically neutral and/or statistically frequent one. That vowel, then, becomes, by default, the inherent or automatic vowel, whether it is part of an alphabet-like system with separated vowel graphs like Old Persian or Meroitic, or of a true alphasyllabic system with attached vowel diacritics like Ethiopic or Indic.

The redundant double notation of vowels after syllabic characters of the type *di-i* = */di/* seems to result from the melding of the two systems that presumably governed the formulation of Old Persian script. That is to say, this double notation is typologically a combination of the methods of representing vowels in a syllabary (*di*) and in a modified consonantary (*-i*). Although this, and for that matter several other features of the Old Persian script may seem illogical or inconsistent from our point of view, we need not expect a script like Old Persian, created on the model of pre-existing scripts but essentially a newly invented type of writing, to be totally systematic. Inventions rarely turn out perfectly at the first attempt, and the imperfections and inconsistencies of the Old Persian script simply reflect this fact, though whether they were due to a failure to finish the task of inventing a complete script to represent the Old Persian language, as Hoffmann (1976:626-7) speculates, or whether they simply represent the limit of the inspiration and wisdom of its creators, remains a matter for speculation.

4. Conclusions: Historical, systemic, and other factors in the development of the alphasyllabic scripts

All the alphasyllabaries and related types of scripts discussed here were evidently derived, directly or indirectly, from consonantaries, often modified consonantaries using *matres lectionis* to represent certain vowels. Of course, this is part of a broader and well-attested phenomenon in the history of writing, whereby not only the alphasyllabaries but also the alphabets arose. The differences in outcome depend on the type and degree of refinements in the representation of vowels which were applied to the archetypal consonantaries or modified consonantaries. Several script groups, notably Ethiopic, Indic, and Meroitic, developed systems in

which all vowels but one, typically a frequent and/or phonetically neutral 'default vowel' were explicitly represented. The scripts of this type seem to have developed this technique independently, and to have applied it in differing ways. Other scripts, such as Greek, adapted from Phoenician, and Mongolian, modified from Uyghur and ultimately derived from Aramaic, took the process one step further, so to speak, and represented all the vowels — rather than all but one — with distinct and separate graphs, essentially by extending the *matres lectionis* system, and, in effect converted themselves into alphabets.

The exact origin of the diacritic system of marking vowels in Indic/Ethiopic types of alphasyllabaries, however, remains unexplained, since there is no clear historical prototype for it among the parent Semitic scripts. The closest typological parallel among the Semitic scripts is the various pointing systems sometimes applied to the Syriac, Arabic, and Hebrew consonantaries, in which points or other diacritic marks are placed above or below the consonant to specify the vowel that follows it. Although these 'points' are physically separate from the consonants and hence superficially different from the diacritics of alphasyllabaries, typologically they are virtually the same thing; a pointed consonantary in which all the vowels except a neutral *a* are explicitly indicated by points (plus, in most cases, *matres lectionis*) is in principle no different, systemically, from an Indic alphasyllabic script. An important practical difference, however, is that the Semitic pointing systems were not fully incorporated into the scripts, but rather were reserved for special uses where a more explicit representation of the language was deemed to be desirable, such as in sacred scriptures or in pedagogical texts for children or non-native speakers.

In any case, there is no reason to posit any historical connection between the alphasyllabaries and the pointed consonantaries, which in any case are first attested much later than the earliest alphasyllabaries. Therefore, if only for lack of any other explanation, I would characterize the alphasyllabic system as an independent innovation, first attested, as far as I have been able to determine, in the earliest extant specimens of the Indic scripts from the third century B.C. It is possible, as mentioned above (part 3), that the Ethiopic alphasyllabary arose under Indian influence, but such an assumption is not theoretically necessary, and therefore should not be accepted unless and until direct evidence of it is found. As we have seen in the other instances discussed above, for example that of the Meroitic scripts, systemic innovations in various scripts with regard to the such features as the expanded notation of vowels tend to follow similar patterns of development in cases which are, in all likelihood, historically unconnected.

To return, finally, to the original topic, namely a consideration of the typological and historical character of the Indian scripts: in their essential principle, the Indian scripts are not profoundly different from the other typologically similar scripts discussed in this paper, in that their most characteristic feature, the inherent vowel, is typical of this type of script. The feature which does set the Indic scripts off, in a secondary but nonetheless significant manner, from the other scripts of this type in general and from their nearest analogue, the Ethiopic scripts, in particular, is their treatment of vowelless consonants. The other scripts discussed

here either ignore the problem, representing the vowelless consonant with the inherent vowel (as in Old Persian), or they use the diacritic sign for a particular vowel, typically a weak vowel such as schwa, which is understood to alternatively indicate the absence of a vowel (as in Meroitic and Ethiopic). Only in the Indian scripts do we find special mechanisms to explicitly and distinctively mark the absence of a vowel, namely the formation of consonantal conjuncts and, in limited cases, the use of a vowel cancellation marker.

This refinement in the direction of greater accuracy in representing the spoken language can be attributed to the high degree of linguistic, especially phonetic awareness, that characterized traditional Indian cultural values, especially in the sphere of Sanskrit culture. It was probably precisely because they were so intensely aware of and interested in phonetics and grammar that Indians, in particular brahmanical scholars of Sanskrit, were not satisfied with the approximative, functional quality that suffices in most graphic systems, and felt the need to develop a system which represented the sacred language as exactly as possible. Such a system inevitably involved some sacrifice of practicality for precision, resulting, for example, in complex ligatured clusters of three, four, and occasionally even more consonants. But as we have already seen, this refinement is in all likelihood a historically secondary development of earlier Indic prototypes, only partially attested, in which the notation of geminates and other vowelless consonants was largely ignored. In this perspective, the Indic alphasyllabaries once again are revealed to be less anomalous among alphasyllabaries in general than they seem at first glance.

Table 1:

Comparison of alphasyllabic features in four script groups

	INDIC SCRIPTS	ETHIOPIC SCRIPTS	MEROITIC	OLD PERSIAN CUNEIFORM
INHERENT VOWEL	a	ä	a	[a, but only in a limited set of 13 consonants; other consonants are represented by true syllabic or semi-syllabic characters]
REPRESENTATION OF POST-CONSONANTAL VOWELS	diacritic added to consonant sign	diacritic added to consonant sign	independent graphs (plus four syllabic characters)	independent graph after consonants with inherent vowel, and some times also after syllabic characters; otherwise incorporated within syllabic characters
TYPE(S) OF VOWEL SIGNS	two types: full (initial), and diacritic (post-consonantal)	diacritic only (no initial vowels)	single type, independent; <i>a</i> in initial position only; <i>e</i> , <i>i</i> , and <i>o</i> in post-consonantal position	single type, used initially and post-consonantly (except <i>a</i> is initial only)
REPRESENTATION OF VOWELLESS CONSONANTS	dual system: conjunct (ligatured) consonants within word; vowel cancellation sign in word final position (only in Sanskrit documents)	indicated by 'weak' vowel	indicated by 'weak' vowel	not explicitly indicated; unintended vowel suppressed in reading

NOTES

* This article addresses many of the same issues as those discussed in Bright 1999, which, like this paper, was also presented at the Symposium on Literacy and Writing Systems in Seoul, South Korea, in July 1998. However, whereas Bright (1999:49) prefers a 'formal' typology for alphasyllabaries/abugidas 'which gives more attention to the graphic arrangement of symbols', I follow Daniels' preference for a typology 'based on the "functional" criterion of correspondence between sound and symbol, in particular the importance of the 'inherent' vowel and its replacement by other vowel symbols' (cited by Bright 1999:49).

¹ Thus Sampson (1985:203-4) says that '[w]e may see another kind of method in the madness of our spelling . . . if we . . . think of English spelling as at least partly logographic. . . . [O]ur script might be described as a compromise between the phonographic and logographic principles — somewhat akin, in fact, to Japanese script'.

² Although this distinction may seem obvious to experts in the study of writing systems, I emphasize it here because it is nonetheless not always clearly maintained in descriptions of writing systems.

³ Compare Bright's comments (1999:45, 54) on the limits and value of typological categories.

⁴ The term 'abugida' for scripts of this type was coined by Daniels with reference to the Ethiopic scripts, which generally follow the same principles as the Indic. The term is composed of the first four consonants and vowels of the Ethiopic alphabet, on the analogy of the word 'alphabet'. But Bright (1999:49) prefers the more neutral term 'alphasyllabary', and I have followed his usage in this article. Actually, I would be inclined to refer to this type of writing as 'akṣara script', using the Sanskrit technical term for the graphic syllable unit which constitutes the basic principle of such scripts, for which there is no precise term in English or in any other language as far as I am aware; but in order to avoid further terminological confusion, I have followed Bright's preference.

⁵ On the justification for the use of the term 'diacritic' in this sense, see Bright 1999:47 n.1 and 50.

⁶ Not all alphasyllabic scripts have this feature, presumably because some of them, such as the Ethiopic scripts, are used to represent languages which have no word-initial or syllable-initial vowels.

⁷ For a summary of the features concerned, see Table 1: Comparison of alphasyllabic features in four script groups.

⁸ For example, Whitney (1964 [1889]:26) calculates a percentage of frequency of 19.78 for this phoneme in Sanskrit.

⁹ The other early Indic script is Kharoṣṭhī, which was typologically similar to Brāhmī but historically less influential because it died out in antiquity and has no

surviving descendants (Salomon 1996:375).

¹⁰ See Jensen 1969:346-7 for references. This position is endorsed, though without much evidence, in Chatterji 1968:49-56.

¹¹ This is presumably because the Meroitic vowels, being (unlike the Indic vowels) graphically independent, could stand by themselves in any position, initial or medial, though it is not clear to me whether there are in fact any examples of vowels other than *a* occurring in word-initial position in Meroitic. No such examples appear in the specimen texts that I have been able to consult, but this may be accidental.

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